

Alcoa Corporation

2021 Long-Term Monitoring Data Summary Report

**St. Lawrence River Remediation Project
Long-Term Monitoring Program – Year 12**

December 2021

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St. Lawrence River Remediation Project Long-Term Monitoring Program – Year 12

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Acronyms and Abbreviations

ESD	Explanation of Significant Differences
FYR	Five-Year Review
LTMP	Long-Term Monitoring Plan
mg/kg	milligrams per kilogram
Pace	Pace Analytical, Inc.
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
Site	St. Lawrence River Remediation Project located adjacent to the Alcoa Massena East Plant in Massena, New York
SLRRP	St. Lawrence River Remediation Project
TOC	total organic carbon
USEPA	U.S. Environmental Protection Agency

1 Introduction

This Data Summary Report (DSR) presents the results of the 2021 long-term monitoring (LTM) for the St. Lawrence River Remediation Project (SLRRP) located adjacent to the Alcoa Corporation Massena East Plant (former Reynolds Metal Company [RMC]) in Massena, New York (Site; Figure 1-1). The LTM program has been developed in 5-year monitoring periods with monitoring initiated in 2010 (Year 1), the year after the completion of capping (i.e., 2009). The monitoring conducted in 2021 represents Year 12 of the program.

Long-Term Monitoring Periods

2010-2014 = Years 1-5

2015-2019 = Years 6-10

2020-2024 = Years 11-15

The 5-year monitoring period roughly coincides with USEPA's 5-year review (FYR) process. Year 12 of the LTM program falls into the USEPA's fifth FYR. The purpose of USEPA's FYR is to "evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment" (USEPA, June 2021). USEPA fourth FYR was completed in June 2021 and as described in that document the FYR was completed per the Comprehensive Environmental Response, Compensation, and Liability Act Section 121, consistent with the National Contingency Plan (40 CFR Section 300.430(f)(4)(ii)), and considering USEPA's policy (USEPA, June 2021).

The monitoring described herein was performed in accordance the Long-Term Monitoring Plan for Years 11-15 (LTMP; Arcadis, August 2021). Previous monitoring efforts were presented in each year's respective DSR (Anchor QEA and ARCADIS, March 2011, May 2012, February 2013, February 2014, October 2015, and March 2017 and Arcadis, April 2018 and March 2019).

The components of the 2021 LTM include the following:

- Physical condition of the cap monitoring
- Sediment sampling

Details regarding each of these components including objectives, approach, and results are presented in Sections 2 and 3. The schedule for monitoring to be conducted through 2024 (Year 15) is provided in Section 4, and the references are listed in Section 5.

2 Physical Condition of the Cap Monitoring

Monitoring the physical integrity of the capped portions of the Site was performed from September 20-22, 2021 using physical measurements (i.e., probing) and on October 5, 2021 through visual observations collected via underwater video camera. Monitoring was conducted to verify that the armor layer remains intact and continues to physically isolate the sediments below the cap. Monitoring also measured the amount of habitat layer material and/or deposited sediment overlying the armor stone. The methods utilized for monitoring are summarized in Section 2.1 and results are provided in Section 2.2.

As described in the LTMP (Arcadis, August 2021), additional monitoring is required following a significant hydrodynamic event (i.e., 100-year storm event) or after a boating accident or vessel grounding in the capping area. Weather events and potential boating incidents have been tracked since the previous physical condition of the cap monitoring (2017; Arcadis, April 2018). These conditions were not met and no additional monitoring has been required.

2.1 Approach

Physical integrity monitoring consisted of manual probing and underwater video observation.

Manual probing was performed at a total of 151 locations spaced across the Site at approximately every 1,000 square feet for isolated capped cells and approximately every 2,500 square feet for contiguous capped cells (Figures 2-1 and 2-2). The targeted probing locations coincided with locations used during the 2009 construction verification program, and are the same locations monitored during each of the previous events. Manual probing was performed to document the presence of armor stone, habitat material, and/or other substrate covering the stone. Probing was conducted in accordance with the protocol described in the LTMP (Arcadis, August 2021). At each monitoring location, a graduated rod was used to penetrate the habitat material or other deposited material until refusal was met. Penetration depth was measured at each location using the probing rod gradations (0.1-foot intervals).

Visual observations of the cap surface were made at 10 percent ($n = 15$) of the probing locations utilizing an underwater camera. These locations were selected to provide representative coverage of the cap areas and are generally consistent with the locations observed during previous LTM events. At each location, the video camera was lowered through the water column with the camera facing down to a depth near the cap surface. The camera and lens were then adjusted to provide a video sweep of the nearby area to visually assess the presence of the armor layer and/or overlying material as possible.

2.2 Results

The physical integrity monitoring confirmed that the cap remains intact with armor stone (identified as cobble in the field) identified at all the long-term monitoring locations (Table 2-1). This result is consistent with the findings from the previous monitoring events (2010 through 2014 and 2017).

Manual probing indicated that habitat or other deposited material is present at most of the locations in varying thickness. Table 2-1 presents the probing results for each of the probing locations. Thickness measurements from probing indicated an average material thickness of approximately 0.4 feet and median material thickness of

approximately 0.3 feet overlaying the armor stone. This is comparable with the average and median thickness observed during previous monitoring events as summarized in Table 2-2.

Table 2-2 Manual Probing Thickness Measurements During Long-Term Monitoring Events

Year	Average Thickness (feet)	Median Thickness (feet)
2010	0.3	0.3
2011	1.0	0.5
2012	0.3	0.3
2013	0.3	0.3
2014	0.2	0.1
2017	0.4	0.3
2021	0.4	0.3

As discussed in the SLRRP Work Plan (Anchor QEA and Arcadis, August 2009), it was anticipated that some redistribution of the habitat layer material would occur based on the Site's hydrodynamic conditions. Appendix A presents the underwater video surveys from each video location. The underwater video surveys confirmed the findings of the manual probing effort, showing substrate present over the armored cap. Note that there are several instances where the vegetation present at the video location impacted the clarity of the video coverage.

3 Sediment Sampling

Sediment sampling was performed to document the surface sediment concentrations of select cells capped in 2009 and cells dredged in 2001 with no subsequent cap placement in 2009. At the request of USEPA, sediment samples were collected from cells with polycyclic aromatic hydrocarbon (PAH) or polychlorinated biphenyl (PCB) concentrations above the cleanup goals based on results from the 2016 LTM sampling event (Anchor QEA and Arcadis, March 2017). The 2016 event targeted cells dredged in 2001 that exceeded the 10 parts per million (ppm) PAH cleanup goal after dredging but were not capped in 2009 in accordance with the ESD (USEPA, December 2008). Similarly, sediment samples were collected from cells with PCB levels in 2016 above the cleanup goal (1 ppm), including one cell dredged in 2001 but not capped in 2009 as well as a cell capped in 2009. Sampling activities were conducted September 23 and 24, 2021.

3.1 Approach

Sediment sampling included the collection of surface grab samples (approximately the top 3 to 4 inches) using a petite ponar grab sampler in accordance with the protocol described in the LTMP (Arcadis, August 2021). A total of 9 cells were targeted for sampling, and recoverable material was identified and collected from each of the targeted locations within these cells. Grab samples from each cell targeted 5 locations evenly distributed throughout each cell (i.e., in a number 5 die pattern) which were composited and homogenized to form a single sample for analysis. Note that while recoverable sediment was present at each location, there may have been less than 3 to 4 inches typically collected by the petite ponar grab sampler.

Figure 3-1 provides the sediment sample locations. Sediment sampling and associated analyses were performed as follows:

- Sampled 7 uncapped cells with 2016 results greater than the 10 ppm PAH cleanup goal: A-20, C-7, C-88, C-89, D-27, D-116, and D-117/118
 - Samples were submitted for PAH (Method 8270C), percent moisture, and total organic carbon (TOC) analyses. A-20 was submitted for PCB (Aroclor; Method 8082A) analysis as the 2016 result was greater than 1 ppm.
- Sampled 1 uncapped cell with 2016 results greater than the 1 ppm PCB cleanup goal: D-108
 - Sample was submitted for PCB (Aroclor; Method 8082A), percent moisture, and TOC analyses.
- Sampled 1 capped cell with 2016 results greater than the 1 ppm PCB cleanup goal: D-126
 - Sample was submitted for PCB (Aroclor; Method 8082A), percent moisture, and TOC analyses.

Composite samples were observed for physical characterization, including general soil type (sand, silt, clay, and organic matter/other matter), as determined using the Unified Soil Classification System, and approximate grain size category (fine, medium, coarse). Sediment generally consisted of silt and sandy materials, with some samples containing organic materials/vegetation.

A total of 9 samples were processed and submitted to Pace Analytical Services, LLC in Melville, NY for laboratory analysis. Quality assurance/quality control samples included 1 blind duplicate sample and 1 matrix spike/matrix spike duplicate sediment sample, and 2 rinse blank samples (1 rinse blank at the beginning and end of the sampling event). These samples were analyzed for PCBs and PAHs. A data validation report prepared based on the analytical method and USEPA guidelines is provided in Appendix B.

3.2 Results

Sediment PAH, PCB, TOC, and percent moisture results are presented in Table 3-1.

Total PAH results are all less than the cleanup goal of 10 mg/kg (range 0.13 mg/kg to 4.91 mg/kg) except for one cell (C-7) where the result was 50.8 mg/kg. Table 3-2 presents the PAH results of the 2016 and 2021, and a comparison of the data indicate that all 2021 results are lower than the 2016 results.

Total PCB results are all less than the cleanup goal of 1 mg/kg (range non-detect to 1.53 mg/kg) except for one cell (D-126) where the result was 59.1 mg/kg. A comparison of the 2016 and 2021 PCB results, as shown on Table 3-2, indicates the 2021 results are lower than the 2016 results except for D-126.

The average TOC results for the two capped locations were 11,200 to 37,000 mg/kg. The TOC results from the uncapped locations were ranged from 8,110 to 41,400 mg/kg, just slightly lower on average than the capped cells (21,700 mg/kg versus 24,100 mg/kg).

4 Schedule

Sampling conducted in 2021 was the first event in the third 5-year monitoring period (no monitoring was conducted in 2020) and represents Year 12 of the LTM program. The remaining events to be conducted in this period are summarized in Table 4-1. The program components can be adjusted based upon the monitoring results and current status of the Site through discussions with USEPA. The monitoring results will be reviewed and used by USEPA as the basis to conduct the next required 5-year review (targeted for release in 2026).

Table 4-1 Years 11-15 Long-Term Monitoring Schedule

Monitoring Activity	Year 11 (2020)	Year 12 (2021)	Year 13 (2022)	Year 14 (2023)	Year 15 (2024)
Physical Condition of Cap		X			
Sediment		X	X		
Fish (YOY and Adult)			X		X

Note: Physical condition of the cap monitoring will also be performed after a significant hydrodynamic event or vessel grounding.

5 References

- Anchor QEA and Arcadis, April 2009. Work Plan. St. Lawrence River Remediation Project.
- Anchor QEA and ARCADIS, March 2011. 2010 Long-Term Monitoring Data Summary Report. St. Lawrence River Remediation Project.
- Anchor QEA and ARCADIS, May 2012b. 2011 Long-Term Monitoring Data Summary Report. St. Lawrence River Remediation Project.
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- Anchor QEA and ARCADIS, October 2015. 2014 Long-Term Monitoring Data Summary Report. St. Lawrence River Remediation Project.
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- Arcadis, March 2019. 2018 Long-Term Monitoring Data Summary Report. St. Lawrence River Remediation Project.
- Arcadis, August 2021. Long-Term Monitoring Plan Years 11-15 (2020-2024). St. Lawrence River Remediation Project.
- USEPA, December 2008. Explanation of Significant Differences; Reynolds Metals Company Site; Village of Massena, St. Lawrence County, New York.
- USEPA, June 2021. Fourth Five-Year Review Report for the Reynolds Metals Superfund Site, St. Lawrence County, Town of Massena, New York.

Tables

Table 2-1
Physical Condition Cap Monitoring
2021 Long-Term Monitoring Data Summary Report
St. Lawrence River Remediation Project
Massena, New York

Location ID ²	Coordinates		Water Depth (Feet)	Probe Penetration Depth (Feet)	Description
	Northing ¹	Easting ¹			
A-04-07	2242294.4	428947.8	16.8	0.2	Sand, Gravel, Cobble
A-07-29	2242193.2	428893.8	11.7	0.3	Sand, Gravel, Cobble
A-07-43	2242219.7	428844.3	7.1	0.2	Sand, Gravel, Cobble
A-07-52	2242225.9	428888.0	10.4	0.2	Sand, Gravel, Cobble
A-08-25	2242202.1	428934.5	15.1	0.2	Sand, Gravel, Cobble
A-08-46	2242234.7	428929.7	14.9	0.3	Sand, Gravel, Cobble
A-09-17	2242204.0	428978.3	18.5	0.0	Gravel, Cobble
A-09-39	2242246.3	429000.0	20.8	0.1	Sand, Gravel, Cobble
A-09-47	2242242.2	428961.5	18.7	0.5	Sand, Gravel, Cobble
A-14-18	2242299.5	429337.1	17.4	0.4	Silt, Sand, Gravel, Cobble
A-14-22	2242295.8	429317.9	18.3	0.3	Sand, Gravel, Cobble
A-14-31	2242332.0	429338.2	16.2	0.3	Sand, Gravel, Cobble
A-14-35³	2242324.3	429310.6	13.5	0.1	Gravel, Cobble
A-16-07	2242152.8	428905.1	12.7	0.8	Sand, Gravel, Cobble
A-16-26	2242160.4	428944.3	17.8	1.2	Sand, Gravel, Cobble
A-17-14³	2242166.2	428987.4	20.0	0.5	Sand, Gravel, Cobble
A-25-33	2242126.1	428952.4	18.2	0.0	Gravel, Cobble
A-32-07	2242040.0	428925.1	10.0	1.5	Sand, Gravel, Cobble
A-32-34	2242069.1	428944.0	13.1	0.8	Sand, Gravel, Cobble
C-03-18	2242194.0	426937.5	8.9	0.1	Gravel, Cobble
C-03-22	2242189.2	426912.1	9.0	0.2	Gravel, Cobble
C-03-28	2242221.2	426929.8	8.4	0.1	Silt, Sand, Cobble
C-03-32	2242220.8	426902.9	11.5	2.0	Silt, Sand, Cobble
C-13-18	2242296.3	427420.7	13.1	0.1	Gravel, Cobble
C-13-22	2242297.6	427405.1	13.1	1.2	Sand, Gravel, Cobble
C-13-29	2242325.7	427392.7	11.0	0.1	Sand, Cobble
C-13-33	2242330.9	427419.6	9.9	0.3	Sand, Gravel, Cobble
C-15-03	2242319.1	427507.0	12.8	0.6	Sand, Cobble
C-15-10	2242349.0	427504.3	16.0	0.6	Sand, Cobble
C-15-19³	2242317.1	427517.2	11.7	0.3	Sand, Cobble
C-15-24	2242352.2	427526.4	16.3	0.3	Gravel, Cobble
C-18-20	2242145.8	426859.2	9.4	0.4	Gravel, Cobble
C-21-17³	2242184.2	427007.3	9.8	0.6	Sand, Cobble
C-23-10	2242201.5	427105.5	7.8	0.2	Sand, Gravel, Cobble
C-24-10	2242213.5	427151.6	12.8	0.4	Sand, Gravel, Cobble
C-27-10	2242247.4	427295.9	6.6	0.0	Cobble
C-28-10	2242257.1	427349.7	9.5	0.1	Gravel, Cobble
C-31-01	2242266.6	427486.8	8.5	0.1	Gravel, Cobble
C-31-07	2242272.9	427521.2	9.5	0.7	Sand, Gravel, Cobble
C-31-12	2242302.0	427514.4	10.7	0.1	Gravel, Cobble
C-31-19	2242291.3	427478.9	7.5	0.2	Gravel, Cobble
C-36-15	2242093.7	426844.7	7.6	0.2	Gravel, Cobble
C-37-11	2242113.9	426892.9	11.7	0.3	Sand, Cobble
C-38-18	2242120.6	426945.4	11.3	1.1	Sand, Cobble
C-39-23	2242132.0	426993.2	11.8	1.0	Sand, Gravel, Cobble
C-41-27	2242149.5	427085.0	8.9	1.1	Silt, Sand, Gravel, Cobble

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2021 Long-Term Monitoring Data Summary Report
St. Lawrence River Remediation Project
Massena, New York

Location ID ²	Coordinates		Water Depth (Feet)	Probe Penetration Depth (Feet)	Description
	Northing ¹	Easting ¹			
C-42-20	2242157.5	427141.3	4.9	0.2	Sand, Cobble
C-43-11	2242169.9	427198.5	11.4	0.6	Sand, Gravel, Cobble
C-44-17	2242184.7	427242.7	12.4	0.1	Gravel, Cobble
C-45-11	2242196.3	427292.7	8.6	0.4	Sand, Cobble
C-46-18	2242202.8	427342.0	7.2	0.4	Sand, Cobble
C-49-02	2242223.3	427501.8	10.0	0.3	Gravel, Cobble
C-49-08	2242218.2	427473.2	14.0	0.2	Sand, Gravel, Cobble
C-49-15	2242248.8	427471.5	12.1	0.6	Sand, Gravel, Cobble
C-49-25	2242243.2	427489.5	13.1	0.8	Sand, Gravel, Cobble
C-52-06³	2242264.9	427623.4	14.0	0.7	Sand, Gravel, Cobble
C-52-23	2242270.5	427656.9	15.8	0.4	Sand, Gravel, Cobble
C-53-11	2242275.8	427686.0	17.4	0.1	Sand, Gravel, Cobble
C-60-19	2242115.3	427122.8	7.0	0.7	Sand, Gravel, Cobble
C-61-18	2242121.9	427164.9	4.5	0.2	Gravel, Cobble
C-62-15³	2242136.0	427229.4	8.0	0.9	Silt, Sand, Cobble
C-63-22	2242145.7	427268.8	8.7	0.3	Silt, Sand, Cobble
C-64-18	2242156.0	427323.1	8.5	0.9	Silt, Sand, Gravel, Cobble
C-65-09	2242164.3	427367.0	5.8	0.2	Gravel, Cobble
C-68-07	2242192.6	427526.5	11.6	0.4	Sand, Gravel, Cobble
C-68-11	2242207.4	427518.2	12.0	0.3	Sand, Gravel, Cobble
C-68-27	2242189.3	427509.4	10.6	0.2	Gravel, Cobble
C-68-31	2242211.2	427509.2	11.9	0.3	Sand, Gravel, Cobble
C-75-45	2242071.8	427162.3	2.3	0.0	Gravel, Cobble
C-76-43	2242072.4	427210.6	3.0	0.1	Sand, Cobble
C-77-20	2242087.6	427256.0	4.2	0.0	Cobble
C-78-25	2242100.6	427310.1	2.5	0.0	Cobble
C-79-08	2242116.4	427356.0	7.7	0.5	Sand, Gravel, Cobble
C-80-07	2242120.3	427408.0	5.7	0.4	Silt, Sand, Gravel, Cobble
C-86-45	2242039.5	427190.2	2.2	0.0	Gravel, Cobble
D-15-12	2242411.0	426999.0	11.0	0.5	Sand, Gravel, Cobble
D-15-18	2242408.6	427029.2	11.0	0.4	Sand, Gravel, Cobble
D-15-31	2242383.8	427003.8	14.8	0.4	Sand, Gravel, Cobble
D-15-38	2242391.6	427026.1	12.0	0.8	Silt, Sand, Gravel, Cobble
D-17-07	2242439.7	427134.7	18.2	0.2	Sand, Gravel, Cobble
D-17-14	2242405.3	427145.9	11.2	0.3	Sand, Gravel, Cobble
D-17-39	2242414.8	427174.2	10.7	0.2	Sand, Gravel, Cobble
D-17-46	2242445.6	427170.8	9.6	0.3	Sand, Gravel, Cobble
D-21-14	2242466.7	427422.1	8.5	0.2	Gravel, Cobble
D-21-22	2242495.6	427404.0	8.5	0.3	Sand, Gravel, Cobble
D-21-39	2242472.6	427446.1	10.0	0.2	Sand, Cobble
D-21-46	2242503.9	427445.1	7.4	0.2	Gravel, Cobble
D-25-07	2242558.9	427686.6	15.5	1.1	Sand, Gravel, Cobble
D-25-14³	2242529.5	427689.2	13.6	0.3	Sand, Gravel, Cobble
D-25-39	2242533.6	427726.6	12.5	0.2	Gravel, Cobble
D-25-46	2242563.8	427718.0	15.6	0.2	Sand, Gravel, Cobble
D-41-13	2242353.0	426974.2	13.3	0.5	Sand, Gravel, Cobble
D-41-26	2242361.7	427005.1	15.8	0.9	Silt, Sand, Gravel, Cobble

Table 2-1
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2021 Long-Term Monitoring Data Summary Report
St. Lawrence River Remediation Project
Massena, New York

Location ID ²	Coordinates		Water Depth (Feet)	Probe Penetration Depth (Feet)	Description
	Northing ¹	Easting ¹			
D-41-36	2242314.5	426977.7	11.8	0.3	Silt, Sand, Gravel, Cobble
D-41-46	2242325.6	427005.7	14.9	0.4	Sand, Gravel, Cobble
D-46-06	2242403.5	427321.5	13.0	0.5	Sand, Gravel, Cobble
D-46-24	2242409.7	427355.9	11.5	0.4	Sand, Gravel, Cobble
D-46-47³	2242428.8	427352.6	9.8	0.1	Sand, Gravel, Cobble
D-46-61	2242421.2	427321.4	12.8	0.3	Sand, Gravel, Cobble
D-61-13*	2242183.1	426467.9	26.4	0.2	Sand, Gravel, Cobble
D-61-18	2242186.0	426498.2	25.7	0.5	Sand, Gravel, Cobble
D-61-42	2242151.7	426477.8	24.4	0.3	Gravel, Cobble
D-61-47	2242152.9	426510.0	21.1	0.4	Silt, Gravel, Cobble
D-68-03	2242262.9	426947.8	10.0	0.3	Sand, Cobble
D-68-27	2242281.0	426951.2	8.9	0.1	Silt, Sand, Cobble
D-68-47	2242269.9	426982.1	9.8	0.1	Sand, Gravel, Cobble
D-68-51³	2242290.3	426978.5	11.8	0.3	Sand, Gravel, Cobble
D-80-15	2242431.4	427776.0	9.0	0.5	Sand, Gravel, Cobble
D-80-33	2242433.2	427816.7	8.5	0.1	Gravel, Cobble
D-80-48	2242463.3	427779.8	9.1	0.3	Gravel, Cobble
D-80-62	2242470.1	427805.4	9.0	0.3	Gravel, Cobble
D-82-03	2242467.7	427912.2	12.5	0.4	Silt, Sand, Gravel, Cobble
D-82-22	2242472.1	427941.2	10.8	0.3	Gravel, Cobble
D-82-44	2242503.3	427950.1	12.5	0.5	Silt, Gravel, Cobble
D-82-58	2242491.6	427906.6	11.0	0.5	Gravel, Cobble
D-91-18	2242179.4	426727.6	8.6	0.2	Sand, Cobble
D-91-23	2242181.2	426748.5	8.2	0.0	Cobble
D-91-48³	2242155.8	426731.1	11.0	0.6	Silt, Sand, Cobble
D-91-55	2242160.3	426761.1	7.9	0.2	Sand, Gravel, Cobble
D-93-10	2242354.5	427693.6	13.1	0.5	Sand, Gravel, Cobble
D-93-26	2242397.7	427710.8	7.9	3.0	Silt, Sand, Gravel, Cobble
D-93-33	2242385.8	427689.9	9.1	3.0	Silt, Sand, Cobble
D-93-52	2242364.7	427722.2	7.2	0.2	Sand, Cobble
D-110-15	2242350.9	427978.0	12.3	0.4	Gravel, Cobble
D-110-33	2242347.7	427941.8	14.3	0.4	Gravel, Cobble
D-110-44	2242371.3	427946.9	16.9	0.5	Sand, Cobble
D-110-58	2242378.5	427972.8	14.7	0.7	Sand, Gravel, Cobble
D-112-19³	2242399.3	428084.5	19.1	0.3	Sand, Gravel, Cobble
D-117-08	2242231.5	427714.5	7.7	0.2	Gravel, Cobble
D-117-09	2242268.2	427740.5	12.3	0.7	Sand, Gravel, Cobble
D-117-20	2242243.3	427750.1	6.1	0.3	Gravel, Cobble
D-117-21	2242265.5	427712.1	15.0	0.4	Sand, Cobble
D-118-04³	2242245.1	427782.8	5.0	0.0	Cobble
D-118-19	2242288.8	427807.7	11.3	0.4	Sand, Cobble
D-118-23	2242263.7	427826.4	8.9	0.1	Gravel, Cobble
D-118-40	2242274.6	427782.4	10.8	0.0	Gravel, Cobble
D-121-11	2242296.1	428019.0	15.6	0.7	Silt, Sand, Gravel, Cobble
D-121-15	2242324.7	427987.0	8.8	0.0	Cobble
D-121-22	2242329.7	428014.5	13.5	0.5	Sand, Gravel, Cobble

Table 2-1
Physical Condition Cap Monitoring
2021 Long-Term Monitoring Data Summary Report
St. Lawrence River Remediation Project
Massena, New York

Location ID ²	Coordinates		Water Depth (Feet)	Probe Penetration Depth (Feet)	Description
	Northing ¹	Easting ¹			
D-121-43³	2242292.1	427986.3	6.0	0.3	Sand, Cobble
D-123-08	2242339.4	428117.5	16.5	0.5	Sand, Cobble
D-123-51	2242351.5	428164.1	12.0	0.2	Sand, Gravel, Cobble
D-124-13	2242357.1	428204.8	12.8	0.8	Sand, Cobble
D-125-12	2242369.7	428251.9	11.4	0.3	Sand, Gravel, Cobble
D-125-29³	2242373.6	428283.2	12.1	0.4	Sand, Gravel, Cobble
D-126-36	2242264.5	427972.4	5.8	0.2	Gravel, Cobble
D-126-45	2242233.5	427983.5	7.8	0.0	Gravel, Cobble
D-126-75	2242239.1	428008.3	11.8	0.2	Gravel, Cobble
D-126-80	2242260.6	428006.6	14.3	0.6	Silt, Sand, Gravel, Cobble
D-143-06	2242384.4	428319.1	11.3	0.2	Sand, Gravel, Cobble
D-143-22	2242386.9	428359.4	12.1	1.3	Sand, Gravel, Cobble

Notes:

1. Coordinates are based on the North American Datum of 1983, New York East Zone, US Survey Foot.
2. Locations are shown on Figures 2-1 and 2-2.
3. Underwater video obtained from bolded locations. Video can be found in Appendix A.

Table 3-1
2021 Sediment Sampling Results
2021 Long-Term Monitoring Data Summary Report
St. Lawrence River Remediation Project
Massena, New York

Constituents	Uncapped Locations							Capped Locations			
	A-20-COMP		C-7-COMP	C-88-COMP	C-89-COMP	D-27-COMP	D-108-COMP	D-116-COMP		D-117/118-COMP	D-126-COMP
	Parent	Duplicate						Parent	Duplicate		
PAHs (mg/kg)^{2,3}											
Acenaphthene	ND (0.0097)	--	0.171	ND (0.0057)	0.0078	ND (0.0102)	--	ND (0.0097)	0.0115	ND (0.008)	--
Acenaphthylene	ND (0.0097)	--	ND (0.0085)	ND (0.0057)	ND (0.0059)	ND (0.0102)	--	ND (0.0097)	ND (0.0099)	ND (0.008)	--
Anthracene	0.043	--	0.277	ND (0.0057)	0.0093	ND (0.0102)	--	0.016	0.0348	0.0149	--
Benzo(a)anthracene	0.452	--	4.07 D	0.0114	0.0121	0.0462	--	0.0883 J	0.363 J	0.0474	--
Benzo(a)pyrene	0.42	--	2.92 D	0.006	0.0085	0.0432	--	0.129 J	0.279 J	0.0617	--
Benzo(b)fluoranthene	1.38 D	--	8.79 D	0.0287	0.0267	0.0818	--	0.348 J	1.47 DJ	0.126	--
Benzo(g,h,i)perylene	0.277	--	2.11 D	0.0069	0.008	0.0428	--	0.125 J	0.268 J	0.06	--
Benzo(k)fluoranthene	0.41	--	3.32 D	0.013	0.0129	0.0439	--	0.0972 J	0.503 J	0.067	--
Chrysene	1.49 D	--	11.6 D	0.0257	0.0211	0.0792	--	0.284 J	0.993 DJ	0.161	--
Dibenz(a,h)anthracene	0.0865	--	0.538	ND (0.0057)	ND (0.0059)	ND (0.0102)	--	0.0398 J	0.114 J	0.0209	--
Fluoranthene	0.802 D	--	8.26 D	0.0201	0.0201	0.0775	--	0.0667 J	0.250 J	0.0509	--
Fluorene	ND (0.0097)	--	0.252	ND (0.0057)	0.008	ND (0.0102)	--	ND (0.0097)	0.015 J	ND (0.008)	--
Indeno(1,2,3-cd)pyrene	0.239	--	1.6 D	0.0065	0.0079	0.0356	--	0.107 J	0.264 J	0.0511	--
Napthalene	0.0129	--	0.0185	ND (0.0057)	0.0077	ND (0.0102)	--	ND (0.0097)	0.0115	ND (0.008)	--
Phenanthrene	0.054	--	0.109	ND (0.0057)	0.0106	0.0192	--	0.033 J	0.121 J	0.0328	--
Pyrene	0.449	--	6.74 D	0.0116	0.0138	0.0585	--	0.0463 J	0.211 J	0.0401	--
Total	6.1154	--	50.7755	0.1299	0.1745	0.5279	--	1.3803	4.9088	0.7338	--
PCBs (mg/kg)^{2,3}											
Aroclor 1016	ND (0.321)	ND (0.0566)	--	--	--	--	ND (0.106)	--	--	--	ND (0.0669)
Aroclor 1221	ND (0.321)	ND (0.0566)	--	--	--	--	ND (0.106)	--	--	--	ND (0.0669)
Aroclor 1232	ND (0.321)	ND (0.0566)	--	--	--	--	ND (0.106)	--	--	--	ND (0.0669)
Aroclor 1242	1.53 J	0.734 J	--	--	--	--	ND (0.106)	--	--	--	59.1
Aroclor 1248	ND (0.321)	ND (0.0566)	--	--	--	--	ND (0.106)	--	--	--	ND (0.0669)
Aroclor 1254	ND (0.321)	ND (0.0566)	--	--	--	--	ND (0.106)	--	--	--	ND (0.0669)
Aroclor 1260	ND (0.321 J)	ND (0.0566)	--	--	--	--	ND (0.106)	--	--	--	ND (0.0669)
Total	1.53	0.734	--	--	--	--	ND	--	--	--	59.1
TOC (mg/kg)³											
TOC	20200 J	--	22200 J	11500 J	8110 J	17000 J	20300 J	41400 J	32700 J	11200 J	37000
Percent Moisture (%)³											
Percent Moisture	48.9	42.3	41.9	12.2	15.2	51.4	69.3	48.8	50	38	50.8

- Notes:
1. Sample locations are provided on Figure 3-1.
 2. Non-detect samples are listed with the practical quantitation limit in parentheses.
 3. Data are preliminary and have not undergone QA/QC.

Acronyms:

ND Analyte not detected at a concentration greater than the Practical Quantitation Limit.

PAHs polyaromatic hydrocarbons

PCBs polychlorinated biphenyls

TOC total organic carbon

mg/kg milligrams per kilogram

-- Not targeted for analysis

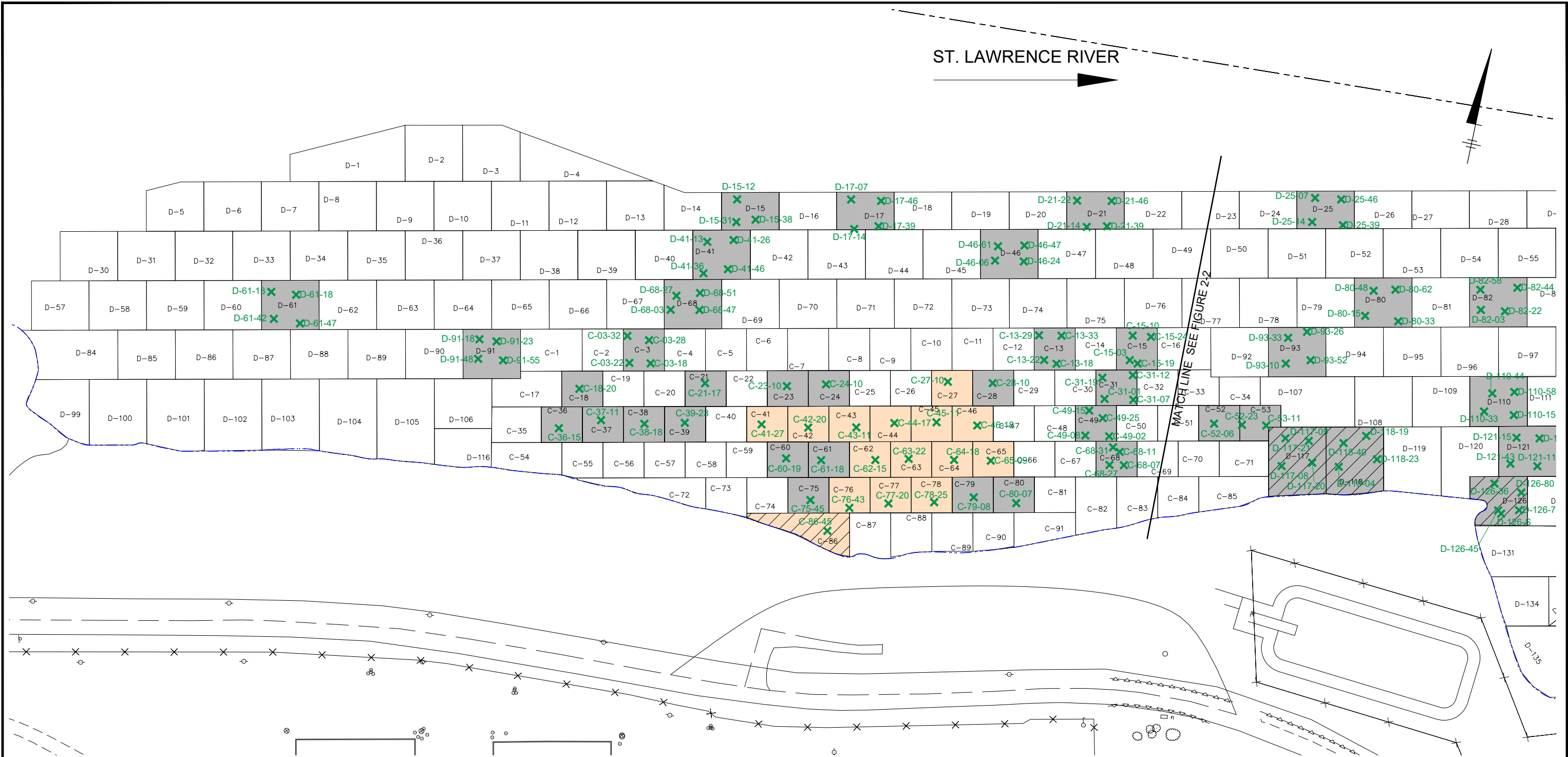
J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

D Dilution required for sample analysis.

Table 3-2
2016 and 2021 Sediment Sampling Results Comparison
2021 Long-Term Monitoring Data Summary Report
St. Lawrence River Remediation Project
Massena, New York

Constituents	Uncapped Locations							Capped Locations	
	A-20-COMP	C-7-COMP	C-88-COMP	C-89-COMP	D-27-COMP	D-108-COMP	D-116-COMP	D-117/118-COMP	D-126-COMP
PAHs (mg/kg)^{2,3,4}									
2016	29.62	86.29	No recovery	No recovery	15.74	--	10.84	No recovery	--
2021	6.12	50.78	0.13	0.17	0.53	--	1.38 (4.91)	0.73	--
PCBs (mg/kg)^{2,3,4}									
2016	9.54	--	--	--	--	2.37	--	--	1.36
2021	1.53 (0.73)	--	--	--	--	ND(0.106)	--	--	59.10

Figures

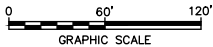


LEGEND:

- APPROXIMATE SHORELINE
- 2001 SLRRP REMEDIATION AREA
- CELLS EXCAVATED DURING 2009 SLRRP ACTIVITIES PRIOR TO CAP PLACEMENT
- CELLS ADDRESSED DURING 2009 SLRRP ACTIVITIES WITH PAH CAP
- CELLS ADDRESSED DURING 2009 SLRRP ACTIVITIES WITH PCB CAP
- 2021 PHYSICAL CONDITION CAP MONITORING LOCATIONS

NOTES:

1. BASE MAP INFORMATION OBTAINED FROM THEW ASSOCIATES, PLLC. DATED 2004 AND 2006.
2. SELECT 2009 POST-ARMOR SURVEY LOCATIONS AND COORDINATES WERE TARGETED FOR THE 2021 PHYSICAL CONDITION CAP MONITORING EFFORTS.



ST. LAWRENCE RIVER REMEDIATION PROJECT
MASSENA, NEW YORK
LONG TERM MONITORING

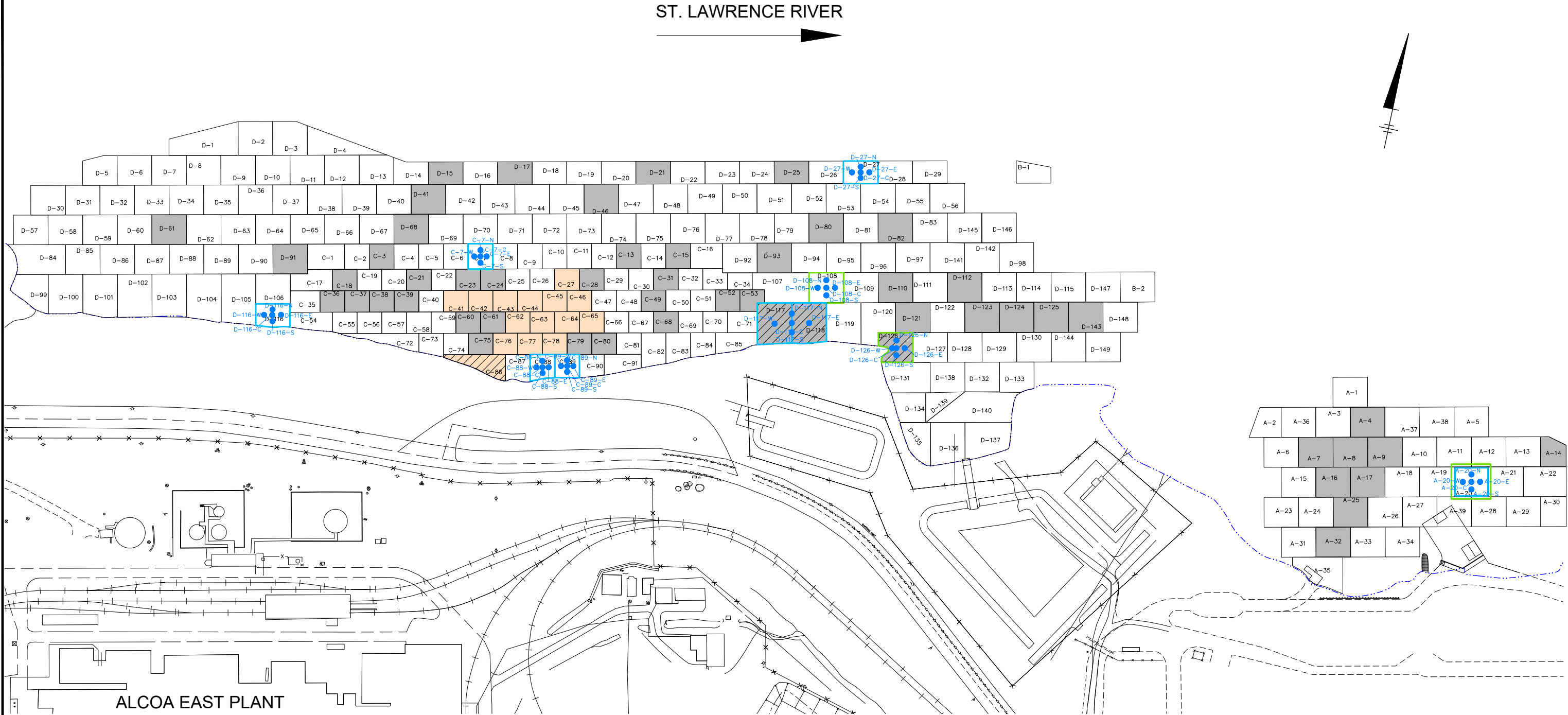
2021 PHYSICAL CONDITION CAP
MONITORING LOCATION -
UPSTREAM PORTION



FIGURE
2-1



XREFS:
X-BASEMAP
X-LTM-BORDER-LDR



LEGEND:

- APPROXIMATE SHORELINE
- 2001 SLRRP REMEDIATION AREA
- CELLS EXCAVATED DURING 2009 SLRRP ACTIVITIES PRIOR TO CAP PLACEMENT
- CELLS ADDRESSED DURING 2009 SLRRP ACTIVITIES WITH PAH CAP
- CELLS ADDRESSED DURING 2009 SLRRP ACTIVITIES WITH PCB CAP
- 2021 SEDIMENT GRAB SAMPLE LOCATION

- SEDIMENT SAMPLE LOCATION WITH PAH AND TOC ANALYSIS
- SEDIMENT SAMPLE LOCATION WITH PCB AND TOC ANALYSIS

NOTE:

1. BASE MAP INFORMATION OBTAINED FROM THEW ASSOCIATES, PLLC. DATED 2004 AND 2006.

ST. LAWRENCE RIVER REMEDIATION PROJECT
MASSENA, NEW YORK
LONG TERM MONITORING

2021 SEDIMENT SAMPLING LOCATIONS

ARCADIS

FIGURE
3-1

Appendix A

Physical Condition of Cap Monitoring Underwater Video Survey

Appendix B

Data Validation Report

Alcoa

DATA REVIEW

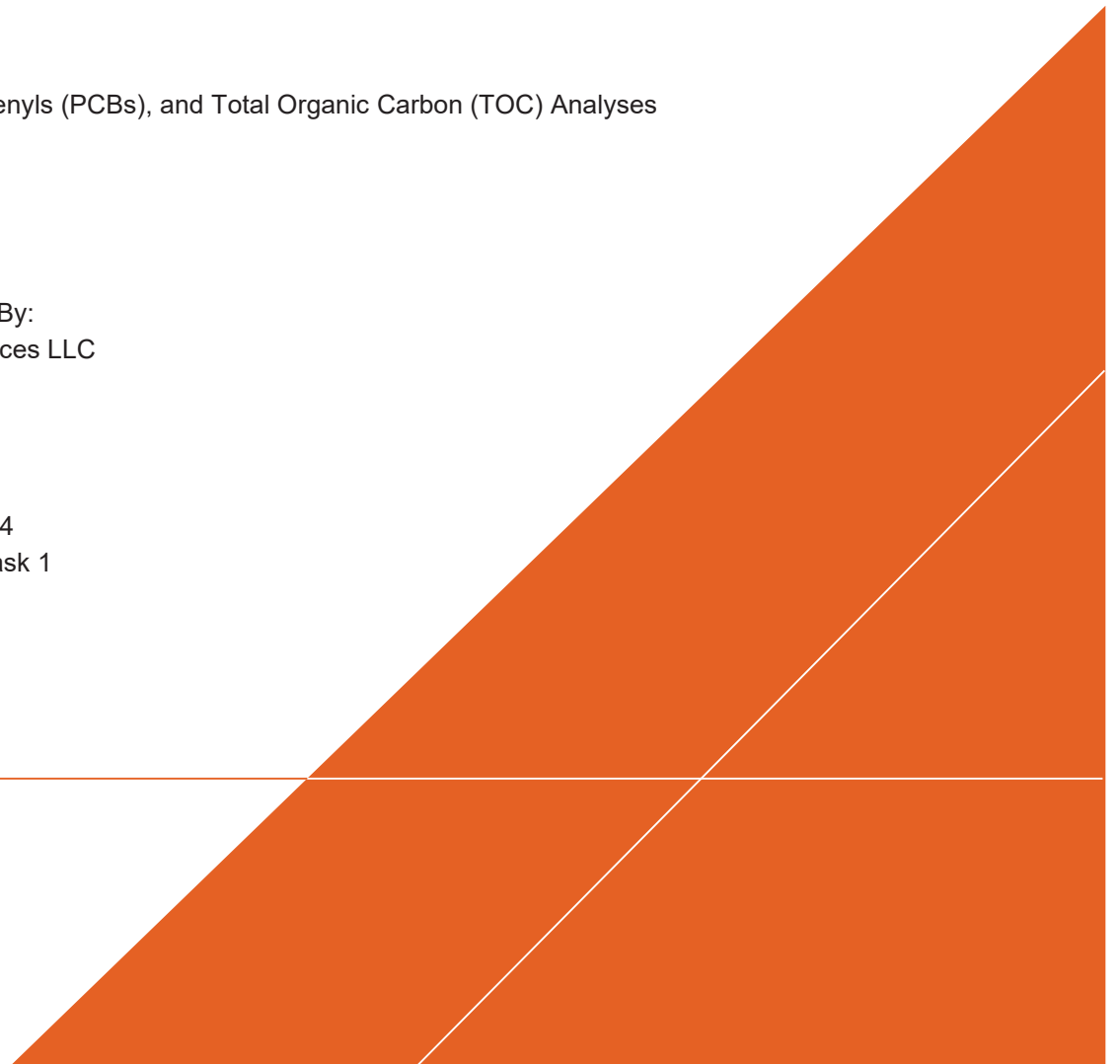
St. Lawrence, New York

Polychlorinated Biphenyls (PCBs), and Total Organic Carbon (TOC) Analyses

SDG #70188934

Analyses Performed By:
Pace Analytical Services LLC
Melville, New York

Report #43435R
Review Level: Stage 4
Project: 30045984 Task 1



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #70188934 for samples collected in association with the Alcoa St. Lawrence site. The review was conducted as a Stage 2 evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					PCBs	SVOCs	TOC
D-126-COMP	70188934001	Soil	9/23/2021		X		X
C-7- COMP	70188934002	Soil	9/24/2021			X	X
D-27-COMP	70188934003	Soil	9/24/2021			X	X
D-117/118-COMP	70188934004	Soil	9/24/2021			X	X
C-88-COMP	70188934005	Soil	9/23/2021			X	X
C-89-COMP	70188934006	Soil	9/23/2021			X	X
D-108-COMP	70188934007	Soil	9/24/2021		X		X
A-20-COMP	70188934008	Soil	9/24/2021		X	X	X
DUP-092421	70188934009	Soil	9/24/2021	A-20-COMP	X		
D-116-COMP	70188934010	Soil	9/23/2021			X	X
DUP-092321	70188934011	Soil	9/23/2021	D-116-COMP		X	X
RB-092321	70188934012	Water	9/23/2021		X	X	
RB-092421	70188934013	Water	9/24/2021		X	X	

Notes:

PCBs = polychlorinated Biphenyls

SVOCs = semivolatile organic compounds

TOC = total organic carbon

The matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample location A-20-COMP for PCBs; sample D-116-COMP for SVOCs analysis; samples C-7- COMP and D-116-COMP for TOC analysis.

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods 8082 and 8270 Selective Ion Monitoring (SIM). Data were reviewed in accordance with USEPA National Functional Guidelines NFG for Organic Superfund Methods Data Review, EPA-540-R-20-005 (November 2020), with reference to the historical USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, OSWER 9240.1-05A-P, October 1999, as appropriate).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The compound was analyzed for but not detected. The associated value is the compound limit of detection.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
 - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Polychlorinated Biphenyls (PCBs) Analyses

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA 8082A	Soil	One year from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Water	One year from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the laboratory specific method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. System Performance

Mass spectrometer performance was acceptable.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

A maximum RSD of 20% is allowed or a correlation coefficient greater than 0.99. Multiple-point calibrations were performed for Aroclors 1016 and 1260 only. Single-point calibrations were performed for the remaining Aroclors.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent recovery (%D) less than the control limit of 15%.

Calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires that one of the two PCB surrogate compounds exhibit recoveries within the QAPP laboratory-established acceptance limits. Note the laboratory-established acceptance limits noted in the QAPP are updated by the laboratory on an annual basis. Those updated limits are reflective with in the current laboratory data package. These updated limits are what was utilized to evaluate the data

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
RB-092321	Tetrachloro-m-xylene	> UL
	Decachlorobiphenyl	AC

Note:

AC = acceptable

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
One surrogate exhibiting recovery outside the control limits but > 10%	Non-detect	No Action
	Detect	

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

The compounds used to perform the MS/MSD analysis must exhibit a percent recovery exhibit recoveries within the QAPP which are laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits. Note the laboratory-established acceptance limits noted in the QAPP are updated by the laboratory on an annual basis. Those updated limits are reflective with in the current laboratory data package. These updated limits are what was utilized to evaluate the data.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on samples where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
A-20-COMP	PCB-1260	AC	>UL

Note:

AC = acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

Sample locations associated with MS/MSD recoveries exhibiting an RPD greater than the control limit are presented in the following table.

Sample Locations	Compound
A-20-COMP	PCB-1260

The criteria used to evaluate the RPD between the MS/MSD recoveries are presented in the following table. In the case of an RPD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ

Control Limit	Sample Result	Qualification
	Detect	J

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits specified in the QAPP. Note the laboratory-established acceptance limits noted in the QAPP are updated by the laboratory on an annual basis. Those updated limits are reflective with in the current laboratory data package. These updated limits are what was utilized to evaluate the data.

Compounds associated with the LCS analysis exhibited recoveries within the control limits. The LCSD analysis was not preformed.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrix is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate/triplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrix.

Results for duplicate/triplicate samples are summarized in the following table.

Sample ID / Duplicate ID	Compounds	Sample Result (µg/kg)	Duplicate Result (µg/kg)	RPD
A-20-COMP / DUP-092421	PCB-1242 (Aroclor 1242)	1530	734	70.3%

The compound PCB-1242 (Aroclor 1242) associated with sample locations A-20-COMP and DUP-092421 exhibited a field duplicate RPD greater than the control limit. The associated sample results from sample locations for the listed compound were qualified as estimated.

9. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the relative percent difference (%RPD) of detected sample results must be less than 40%.

Dual column analysis exhibited RPD within control limits.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR PCBs

PCBs; USEPA 8082A	Reported		Performance Acceptable		Not Required	
	No	Yes	No	Yes		
GAS CHROMATOGRAPHY (GC/ECD)						
Tier II Validation						
Holding times		X		X		
Reporting limits (units)		X		X		
Blanks						
A. Method blanks		X		X		
B. Equipment blanks		X		X		
Laboratory Control Sample (LCS) %R		X		X		
Laboratory Control Sample Duplicate (LCSD) %R	X				X	
LCS/LCSD Precision (RPD)	X				X	
Matrix Spike (MS) %R		X		X		
Matrix Spike Duplicate (MSD) %R		X	X			
MS/MSD Precision (RPD)		X	X			
Lab Duplicate (RPD)	X				X	
Field Duplicate/Triplicate (RPD)		X	X			
Surrogate Spike Recoveries		X	X			
Column (RPD) (If dual column is performed-not confirmation purposes only)		X		X		
Dilution Factor		X		X		
Moisture Content		X		X		
Tier III Validation						
Initial calibration %RSDs		X		X		
Continuing calibration %Ds		X		X		
System performance and column resolution		X		X		
Compound identification and quantitation						
A. Quantitation Reports		X		X		
B. RT of sample compounds within the established RT windows		X		X		
C. Pattern identification		X		X		

Data Review Report

PCBs; USEPA 8082A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation
 %R Percent recovery
 RPD Relative percent difference
 %D Percent difference

Semivolatile Organic Compound (SVOC) Analyses

1. HOLDING TIMES

The specified holding times for the following methods are presented in the table below.

Method	Matrix	Holding Time	Preservation
SW-846 8270	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

Note:

s.u. = standard units

Samples were analyzed within the specified holding time criterion.

2. BLANK CONTAMINATION

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. MASS SPECTROMETER TUNING

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. CALIBRATION

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

5. Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

6. Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

Compounds associated with the calibrations were within the specified control limits.

7. SURROGATES/SYSTEM MONITORING COMPOUNDS

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

Surrogate recoveries were within control limits.

8. INTERNAL STANDARD PERFORMANCE

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

Internal standard responses were within control limits.

9. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) ANALYSIS

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
D-116-COMP	Chrysene	AC	>UL
	Fluoranthene	>UL	AC

Note:

AC = acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

Sample locations associated with MS/MSD recoveries exhibiting an RPD greater than the control limit are presented in the following table.

Sample Locations	Compound
D-116-COMP	Chrysene
	Fluoranthene
	Pyrene

The criteria used to evaluate the RPD between the MS/MSD recoveries are presented in the following table. In the case of an RPD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

10. LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE (LCS/LCSD) ANALYSIS

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Compounds associated with the LCS analysis exhibited recoveries within the control limits. The LCSD analysis was not performed.

11. FIELD DUPLICATE ANALYSIS

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil.

Results for duplicate samples are summarized in the following table.

Sample ID/ Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
D-116-COMP/ DUP-092321	Acenaphthene	<9.7	11.5	AC
	Anthracene	16.0	34.8	AC
	Benzo(a)anthracene	88.3	363	121.7%
	Benzo(a)pyrene	129	279	73.5%
	Benzo(b)fluoranthene	348	1470	119.0%
	Benzo(g,h,i)perylene	125	268	72.8%
	Benzo(k)fluoranthene	97.2	503	135.2%
	Chrysene	284	993	105.6%
	Dibenz(a,h)anthracene	39.8	114	NC
	Fluoranthene	66.7	250	115.8%
	Fluorene	<9.7	15.0	AC
	Indeno(1,2,3-cd)pyrene	107	264	84.6%
	Naphthalene	<9.7	11.5	AC
	Phenanthrene	33.0	121	NC
	Pyrene	46.3	211	128.0%

Note:

AC = acceptable

NC = non-compliant

The compounds Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene associated with sample locations D-116-COMP and DUP-092321 exhibited a field duplicate RPD greater than the control limit. The associated sample results from sample locations for the listed analyte were qualified as estimated.

12.COMPOUND IDENTIFICATION

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

Note: Several compounds in the original analysis of the samples were outside calibration range and flagged with an "E" qualifier and required reanalysis at a higher dilution. These compounds were flagged with a 'D' qualifier on the result forms to indicate the result was reported from a diluted run.

13.SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checklist for SVOCs

SVOCs: SW-846 8270D-SIM	Reported		Performance Acceptable		Not Required	
	No	Yes	No	Yes		
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)						
Tier II Validation						
Holding times		X		X		
Reporting limits (units)		X		X		
Blanks						
A. Method blanks		X		X		
B. Equipment blanks		X		X		
C. Trip blanks	X				X	
Laboratory Control Sample (LCS)		X		X		
Laboratory Control Sample Duplicate (LCSD)	X				X	
LCS/LCSD Precision (RPD)	X				X	
Matrix Spike (MS)		X	X			
Matrix Spike Duplicate (MSD)		X	X			
MS/MSD Precision (RPD)		X	X			
Field/Lab Duplicate (RPD)		X	X			
Surrogate Spike Recoveries		X		X		
Dilution Factor		X		X		
Moisture Content		X		X		
Tier III Validation						
System performance and column resolution		X		X		
Initial calibration %RSDs		X		X		
Continuing calibration RRFs		X		X		
Continuing calibration %Ds		X		X		
Instrument tune and performance check		X		X		
Ion abundance criteria for each instrument used		X		X		
Internal standard		X		X		
Compound identification and quantitation						
A. Reconstructed ion chromatograms		X		X		
B. Quantitation Reports		X		X		

SVOCs: SW-846 8270D-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Method Lloyd Kahn. Data were reviewed in accordance with USEPA National Functional Guidelines NFG for Inorganic Superfund Methods Data Review, EPA-542-R-20-006 (November 2020), with reference to the historical USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, OSWER 9240.1-45, October 2004, as appropriate).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The compound was analyzed for but not detected. The associated value is the compound limit of detection.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
 - NJ The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
 - UB Compound considered non-detect at the listed value due to associated blank contamination.
 - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
 - X This qualifier will be used to define any data that may only be used for screening purposes (nondefinitive data) if the QA/QC deviation warrants the qualification of the data beyond estimation, but not rejection of the data.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and

provides no information as to whether the compound is present or not. “R” values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

TOTAL ORGANIC CARBON (TOC) Analyses

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Total Organic Carbon by Lloyd Kahn	Soil	14 days from collection to analysis	Cool to <6 °C.

Samples were analyzed within the specified holding times. However, the laboratory flagged the TOC sample results with C4 flag, noting that the “Sample container did not meet EPA or method requirements.” After further discussion with the laboratory, the required container for TOC by method Lloyd Kahn is 4-ounce amber glass per the method; however, the laboratory received 2-ounce clear glass jar which were supplied by the laboratory. The associated sample results were qualified as estimate due to the deviation.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all initial calibration verification standard must exhibit recoveries within 90% to 110%.

Calibration standard recoveries were within the control limit.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical

method.

4.1 MS/MSD Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 80% to 120% and RPD 20%. The MS/MSD recovery control limits do not apply for MS/MSD performed on samples where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

All analytes associated with MS/MSD recoveries were within control limits with the exception of the following analyte present in the table below.

Sample Location	Analyte	MS Recovery	MSD Recovery
C-7- COMP	TOC	AC	>UL
D-116-COMP	TOC	<LL but >30%	<LL but >30%

The criteria used to evaluate MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with this SDG.

Control limit	Sample Result	Qualification
MS/MSD percent recovery 30% to 74%	Non-detect	UJ
	Detect	J
MS/MSD percent recovery <30%	Non-detect	R
	Detect	J
MS/MSD percent recovery >125%	Non-detect	No Action
	Detect	J

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the PQL. A control limit of 20% for water matrices and 35% for soil matrix is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrix.

MS/MSD analysis performed in replacement of the laboratory duplicate analysis. The MS/MSD recoveries exhibited acceptable RPD.

5. Field Duplicate/Triplicate Analysis

Field duplicate/triplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrix is applied to the RPD between the parent sample and the field duplicate/triplicate. In the instance when the parent and/or duplicate/triplicate sample

concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrix.

Results for duplicate samples are summarized in the following table.

Sample ID / Duplicate ID / Triplicate ID	Analyte	Sample Result (mg/kg)	Duplicate Result (mg/kg)	RPD
D-116-COMP/ DUP-092321	Total Organic Carbon (TOC)	41400	32700	23.5%

The calculated RPD between the parent samples and field duplicate/triplicates were acceptable.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR TOTAL ORGANIC CARBON (TOC)

TOC: EPA 9060, and Lloyd Kahn	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R		X	X		
MS/MSD Precision (RPD)		X		X	
Lab Duplicate (RPD)	X				X
Field Duplicate/Triplicate (RPD)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculation errors present		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD – relative standard deviation

%R - percent recovery

RPD - relative percent difference,

%D – difference

VALIDATION PERFORMED BY: Todd Church

SIGNATURE:



DATE: December 3, 2021

PEER REVIEW: Joseph C. Houser

DATE: December 7, 2021

CHAIN OF CUSTODY / CORRECTED DATA RESULTS PAGES



QUALIFIERS

Project: SLRRP / 30045984

Pace Project No.: 70188934

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

C2	Relative percent difference between results from each column was greater than 40%. The lower of the two results was reported.
C4	Sample container did not meet EPA or method requirements.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.
S3	Surrogate recovery exceeded laboratory control limits. Analyte presence below reporting limits in associated sample.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
v1	The continuing calibration verification was above the method acceptance limit. Any detection for the analyte in the associated samples may have a high bias.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: SLRRP / 30045984

Pace Project No.: 70188934

Sample: D-126-COMP **Lab ID: 70188934001** Collected: 09/23/21 15:20 Received: 09/25/21 10:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3546								
Pace Analytical Services - Melville								
PCB-1016 (Aroclor 1016)	<6690	ug/kg	6690	100	09/30/21 12:20	10/04/21 11:51	12674-11-2	
PCB-1221 (Aroclor 1221)	<6690	ug/kg	6690	100	09/30/21 12:20	10/04/21 11:51	11104-28-2	
PCB-1232 (Aroclor 1232)	<6690	ug/kg	6690	100	09/30/21 12:20	10/04/21 11:51	11141-16-5	
PCB-1242 (Aroclor 1242)	59100	ug/kg	6690	100	09/30/21 12:20	10/04/21 11:51	53469-21-9	
PCB-1248 (Aroclor 1248)	<6690	ug/kg	6690	100	09/30/21 12:20	10/04/21 11:51	12672-29-6	
PCB-1254 (Aroclor 1254)	<6690	ug/kg	6690	100	09/30/21 12:20	10/04/21 11:51	11097-69-1	
PCB-1260 (Aroclor 1260)	<6690	ug/kg	6690	100	09/30/21 12:20	10/04/21 11:51	11096-82-5	
Surrogates								
Tetrachloro-m-xylene (S)	77	%	46-120	1	09/30/21 12:20	10/01/21 20:26	877-09-8	C2
Decachlorobiphenyl (S)	110	%	47-135	1	09/30/21 12:20	10/01/21 20:26	2051-24-3	C2
Percent Moisture								
Analytical Method: ASTM D2216-05M								
Pace Analytical Services - Melville								
Percent Moisture	50.8	%	0.10	1		10/05/21 01:09		
TOC via Lloyd Kahn								
Analytical Method: Lloyd Kahn								
Pace Analytical Services - Green Bay								
Total Organic Carbon	37000	mg/kg	2290	1		10/05/21 03:25	7440-44-0	C4 J

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: SLRRP / 30045984

Pace Project No.: 70188934

Sample: C-7-COMP **Lab ID: 70188934002** Collected: 09/24/21 10:45 Received: 09/25/21 10:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM		Analytical Method: EPA 8270D SIM Preparation Method: EPA 3545A Pace Analytical Services - Melville						
Acenaphthene	171	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	83-32-9	
Acenaphthene	<427	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	83-32-9	
Acenaphthylene	<8.5	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	208-96-8	
Acenaphthylene	<427	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	208-96-8	
Anthracene	277	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	120-12-7	
Anthracene	490	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	120-12-7	
Benzo(a)anthracene	3610	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	56-55-3	E
Benzo(a)anthracene	4070 D	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	56-55-3	
Benzo(a)pyrene	2080	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	50-32-8	E
Benzo(a)pyrene	2920 D	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	50-32-8	
Benzo(b)fluoranthene	6620	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	205-99-2	E
Benzo(b)fluoranthene	8790 D	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	205-99-2	
Benzo(g,h,i)perylene	1610	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	191-24-2	E
Benzo(g,h,i)perylene	2110 D	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	191-24-2	
Benzo(k)fluoranthene	1910	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	207-08-9	E
Benzo(k)fluoranthene	3320 D	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	207-08-9	
Chrysene	8440	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	218-01-9	E
Chrysene	11600 D	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	218-01-9	
Dibenz(a,h)anthracene	538	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	53-70-3	
Dibenz(a,h)anthracene	567	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	53-70-3	
Fluoranthene	4160	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	206-44-0	E
Fluoranthene	8260 D	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	206-44-0	
Fluorene	252	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	86-73-7	
Fluorene	<427	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	86-73-7	
Indeno(1,2,3-cd)pyrene	1370	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	193-39-5	E
Indeno(1,2,3-cd)pyrene	1600 D	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	193-39-5	
Naphthalene	18.5	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	91-20-3	
Naphthalene	<427	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	91-20-3	
Phenanthrene	109	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	85-01-8	
Phenanthrene	<427	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	85-01-8	
Pyrene	5260	ug/kg	8.5	1	09/29/21 12:44	09/30/21 20:58	129-00-0	E
Pyrene	6740 D	ug/kg	427	50	09/29/21 12:44	10/01/21 12:58	129-00-0	
Surrogates								
2-Methylnaphthalene-d10 (S)	0	%	20-105	50	09/29/21 12:44	10/01/21 12:58	7297-45-2	S4
2-Methylnaphthalene-d10 (S)	29	%	20-105	1	09/29/21 12:44	09/30/21 20:58	7297-45-2	
Fluoranthene-d10 (S)	0	%	33-128	50	09/29/21 12:44	10/01/21 12:58	93951-69-0	S4
Fluoranthene-d10 (S)	38	%	33-128	1	09/29/21 12:44	09/30/21 20:58	93951-69-0	

Percent Moisture

Analytical Method: ASTM D2216-05M

Pace Analytical Services - Melville

Percent Moisture **41.9** % 0.10 1 10/05/21 01:10

TOC via Lloyd Kahn

Analytical Method: Lloyd Kahn

Pace Analytical Services - Green Bay

Total Organic Carbon **22200** mg/kg 2390 1 10/05/21 03:50 7440-44-0 ~~C4,M0~~ J

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: SLRRP / 30045984

Pace Project No.: 70188934

Sample: D-27-COMP **Lab ID: 70188934003** Collected: 09/24/21 10:30 Received: 09/25/21 10:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM								
Analytical Method: EPA 8270D SIM Preparation Method: EPA 3545A Pace Analytical Services - Melville								
Acenaphthene	<10.2	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	83-32-9	
Acenaphthylene	<10.2	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	208-96-8	
Anthracene	<10.2	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	120-12-7	
Benzo(a)anthracene	46.2	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	56-55-3	
Benzo(a)pyrene	43.2	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	50-32-8	
Benzo(b)fluoranthene	81.8	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	205-99-2	
Benzo(g,h,i)perylene	42.8	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	191-24-2	
Benzo(k)fluoranthene	43.9	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	207-08-9	
Chrysene	79.2	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	218-01-9	
Dibenz(a,h)anthracene	<10.2	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	53-70-3	
Fluoranthene	77.5	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	206-44-0	
Fluorene	<10.2	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	86-73-7	
Indeno(1,2,3-cd)pyrene	35.6	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	193-39-5	
Naphthalene	<10.2	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	91-20-3	
Phenanthrene	19.2	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	85-01-8	
Pyrene	58.5	ug/kg	10.2	1	09/29/21 12:44	09/30/21 21:31	129-00-0	
Surrogates								
2-Methylnaphthalene-d10 (S)	48	%	20-105	1	09/29/21 12:44	09/30/21 21:31	7297-45-2	
Fluoranthene-d10 (S)	54	%	33-128	1	09/29/21 12:44	09/30/21 21:31	93951-69-0	

Percent Moisture

Analytical Method: ASTM D2216-05M
Pace Analytical Services - Melville

Percent Moisture	51.4	%	0.10	1		10/05/21 01:10
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TOC via Lloyd Kahn

Analytical Method: Lloyd Kahn
Pace Analytical Services - Green Bay

Total Organic Carbon	17000	mg/kg	2380	1		10/05/21 04:09	7440-44-0	C4	J
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ANALYTICAL RESULTS

Project: SLRRP / 30045984

Pace Project No.: 70188934

Sample: D-117/118-COMP **Lab ID: 70188934004** Collected: 09/24/21 08:20 Received: 09/25/21 10:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM								
Analytical Method: EPA 8270D SIM Preparation Method: EPA 3545A Pace Analytical Services - Melville								
Acenaphthene	<8.0	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	83-32-9	
Acenaphthylene	<8.0	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	208-96-8	
Anthracene	14.9	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	120-12-7	
Benzo(a)anthracene	47.4	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	56-55-3	
Benzo(a)pyrene	61.7	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	50-32-8	
Benzo(b)fluoranthene	126	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	205-99-2	
Benzo(g,h,i)perylene	60.0	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	191-24-2	
Benzo(k)fluoranthene	67.0	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	207-08-9	
Chrysene	161	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	218-01-9	
Dibenz(a,h)anthracene	20.9	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	53-70-3	
Fluoranthene	50.9	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	206-44-0	
Fluorene	<8.0	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	86-73-7	
Indeno(1,2,3-cd)pyrene	51.1	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	193-39-5	
Naphthalene	<8.0	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	91-20-3	
Phenanthrene	32.8	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	85-01-8	
Pyrene	40.1	ug/kg	8.0	1	09/29/21 12:44	09/30/21 22:04	129-00-0	
Surrogates								
2-Methylnaphthalene-d10 (S)	51	%	20-105	1	09/29/21 12:44	09/30/21 22:04	7297-45-2	
Fluoranthene-d10 (S)	61	%	33-128	1	09/29/21 12:44	09/30/21 22:04	93951-69-0	

Percent Moisture

Analytical Method: ASTM D2216-05M
Pace Analytical Services - Melville

Percent Moisture	38.0	%	0.10	1		10/05/21 01:10
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TOC via Lloyd Kahn

Analytical Method: Lloyd Kahn
Pace Analytical Services - Green Bay

Total Organic Carbon	11200	mg/kg	1610	1		10/05/21 04:14	7440-44-0	04	J
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ANALYTICAL RESULTS

Project: SLRRP / 30045984

Pace Project No.: 70188934

Sample: C-88-COMP **Lab ID: 70188934005** Collected: 09/23/21 14:35 Received: 09/25/21 10:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM								
Analytical Method: EPA 8270D SIM Preparation Method: EPA 3545A Pace Analytical Services - Melville								
Acenaphthene	<5.7	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	83-32-9	
Acenaphthylene	<5.7	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	208-96-8	
Anthracene	<5.7	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	120-12-7	
Benzo(a)anthracene	11.4	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	56-55-3	
Benzo(a)pyrene	6.0	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	50-32-8	
Benzo(b)fluoranthene	28.7	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	205-99-2	
Benzo(g,h,i)perylene	6.9	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	191-24-2	
Benzo(k)fluoranthene	13.0	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	207-08-9	
Chrysene	25.7	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	218-01-9	
Dibenz(a,h)anthracene	<5.7	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	53-70-3	
Fluoranthene	20.1	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	206-44-0	
Fluorene	<5.7	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	86-73-7	
Indeno(1,2,3-cd)pyrene	6.5	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	193-39-5	
Naphthalene	<5.7	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	91-20-3	
Phenanthrene	<5.7	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	85-01-8	
Pyrene	11.6	ug/kg	5.7	1	09/29/21 12:44	09/30/21 22:38	129-00-0	
Surrogates								
2-Methylnaphthalene-d10 (S)	52	%	20-105	1	09/29/21 12:44	09/30/21 22:38	7297-45-2	
Fluoranthene-d10 (S)	60	%	33-128	1	09/29/21 12:44	09/30/21 22:38	93951-69-0	

Percent Moisture

Analytical Method: ASTM D2216-05M
Pace Analytical Services - Melville

Percent Moisture	12.2	%	0.10	1		10/05/21 01:10
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TOC via Lloyd Kahn

Analytical Method: Lloyd Kahn
Pace Analytical Services - Green Bay

Total Organic Carbon	11500	mg/kg	307	1		10/05/21 04:20	7440-44-0	C4	J
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ANALYTICAL RESULTS

Project: SLRRP / 30045984

Pace Project No.: 70188934

Sample: C-89-COMP **Lab ID: 70188934006** Collected: 09/23/21 14:48 Received: 09/25/21 10:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM								
Analytical Method: EPA 8270D SIM Preparation Method: EPA 3545A								
Pace Analytical Services - Melville								
Acenaphthene	7.8	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	83-32-9	
Acenaphthylene	<5.9	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	208-96-8	
Anthracene	9.3	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	120-12-7	
Benzo(a)anthracene	12.1	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	56-55-3	
Benzo(a)pyrene	8.5	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	50-32-8	
Benzo(b)fluoranthene	26.7	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	205-99-2	
Benzo(g,h,i)perylene	8.0	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	191-24-2	
Benzo(k)fluoranthene	12.9	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	207-08-9	
Chrysene	21.1	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	218-01-9	
Dibenz(a,h)anthracene	<5.9	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	53-70-3	
Fluoranthene	20.1	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	206-44-0	
Fluorene	8.0	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	86-73-7	
Indeno(1,2,3-cd)pyrene	7.9	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	193-39-5	
Naphthalene	7.7	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	91-20-3	
Phenanthrene	10.6	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	85-01-8	
Pyrene	13.8	ug/kg	5.9	1	09/29/21 12:44	09/30/21 23:11	129-00-0	
Surrogates								
2-Methylnaphthalene-d10 (S)	56	%	20-105	1	09/29/21 12:44	09/30/21 23:11	7297-45-2	
Fluoranthene-d10 (S)	64	%	33-128	1	09/29/21 12:44	09/30/21 23:11	93951-69-0	

Percent Moisture

Analytical Method: ASTM D2216-05M

Pace Analytical Services - Melville

Percent Moisture	15.2	%	0.10	1		10/05/21 01:10
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TOC via Lloyd Kahn

Analytical Method: Lloyd Kahn

Pace Analytical Services - Green Bay

Total Organic Carbon	8110	mg/kg	427	1		10/05/21 04:28	7440-44-0	C4	J
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ANALYTICAL RESULTS

Project: SLRRP / 30045984

Pace Project No.: 70188934

Sample: D-108-COMP **Lab ID: 70188934007** Collected: 09/24/21 10:00 Received: 09/25/21 10:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3546								
Pace Analytical Services - Melville								
PCB-1016 (Aroclor 1016)	<106	ug/kg	106	1	09/30/21 12:20	10/01/21 20:38	12674-11-2	
PCB-1221 (Aroclor 1221)	<106	ug/kg	106	1	09/30/21 12:20	10/01/21 20:38	11104-28-2	
PCB-1232 (Aroclor 1232)	<106	ug/kg	106	1	09/30/21 12:20	10/01/21 20:38	11141-16-5	
PCB-1242 (Aroclor 1242)	<106	ug/kg	106	1	09/30/21 12:20	10/01/21 20:38	53469-21-9	
PCB-1248 (Aroclor 1248)	<106	ug/kg	106	1	09/30/21 12:20	10/01/21 20:38	12672-29-6	
PCB-1254 (Aroclor 1254)	<106	ug/kg	106	1	09/30/21 12:20	10/01/21 20:38	11097-69-1	
PCB-1260 (Aroclor 1260)	<106	ug/kg	106	1	09/30/21 12:20	10/01/21 20:38	11096-82-5	
Surrogates								
Tetrachloro-m-xylene (S)	61	%	46-120	1	09/30/21 12:20	10/01/21 20:38	877-09-8	
Decachlorobiphenyl (S)	52	%	47-135	1	09/30/21 12:20	10/01/21 20:38	2051-24-3	
Percent Moisture								
Analytical Method: ASTM D2216-05M								
Pace Analytical Services - Melville								
Percent Moisture	69.3	%	0.10	1		10/05/21 01:10		
TOC via Lloyd Kahn								
Analytical Method: Lloyd Kahn								
Pace Analytical Services - Green Bay								
Total Organic Carbon	20300	mg/kg	3100	1		10/05/21 04:47	7440-44-0	C4 J

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ANALYTICAL RESULTS

Project: SLRRP / 30045984

Pace Project No.: 70188934

Sample: A-20-COMP **Lab ID: 70188934008** Collected: 09/24/21 07:50 Received: 09/25/21 10:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3546								
Pace Analytical Services - Melville								
PCB-1016 (Aroclor 1016)	<321	ug/kg	321	5	09/27/21 11:27	09/29/21 12:39	12674-11-2	
PCB-1221 (Aroclor 1221)	<321	ug/kg	321	5	09/27/21 11:27	09/29/21 12:39	11104-28-2	
PCB-1232 (Aroclor 1232)	<321	ug/kg	321	5	09/27/21 11:27	09/29/21 12:39	11141-16-5	
PCB-1242 (Aroclor 1242)	1530	ug/kg	321	5	09/27/21 11:27	09/29/21 12:39	53469-21-9	J
PCB-1248 (Aroclor 1248)	<321	ug/kg	321	5	09/27/21 11:27	09/29/21 12:39	12672-29-6	
PCB-1254 (Aroclor 1254)	<321	ug/kg	321	5	09/27/21 11:27	09/29/21 12:39	11097-69-1	
PCB-1260 (Aroclor 1260)	<321	ug/kg	321	5	09/27/21 11:27	09/29/21 12:39	11096-82-5	M1, R1 UJ
Surrogates								
Tetrachloro-m-xylene (S)	92	%	46-120	5	09/27/21 11:27	09/29/21 12:39	877-09-8	
Decachlorobiphenyl (S)	91	%	47-135	5	09/27/21 11:27	09/29/21 12:39	2051-24-3	

8270 MSSV PAH by SIM

Analytical Method: EPA 8270D SIM Preparation Method: EPA 3545A

Pace Analytical Services - Melville

Acenaphthene	<9.7	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	83-32-9	
Acenaphthene	<96.8	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	83-32-9	
Acenaphthylene	<9.7	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	208-96-8	
Acenaphthylene	<96.8	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	208-96-8	
Anthracene	43.0	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	120-12-7	
Anthracene	<96.8	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	120-12-7	
Benzo(a)anthracene	452	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	56-55-3	
Benzo(a)anthracene	502	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	56-55-3	
Benzo(a)pyrene	420	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	50-32-8	
Benzo(a)pyrene	482	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	50-32-8	
Benzo(b)fluoranthene	1200	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	205-99-2	E
Benzo(b)fluoranthene	1380 D	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	205-99-2	
Benzo(g,h,i)perylene	277	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	191-24-2	
Benzo(g,h,i)perylene	357	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	191-24-2	
Benzo(k)fluoranthene	410	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	207-08-9	
Benzo(k)fluoranthene	533	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	207-08-9	
Chrysene	1280	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	218-01-9	E
Chrysene	1490 D	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	218-01-9	
Dibenz(a,h)anthracene	86.5	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	53-70-3	
Dibenz(a,h)anthracene	<96.8	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	53-70-3	
Fluoranthene	688	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	206-44-0	E
Fluoranthene	802 D	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	206-44-0	
Fluorene	<9.7	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	86-73-7	
Fluorene	<96.8	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	86-73-7	
Indeno(1,2,3-cd)pyrene	239	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	193-39-5	
Indeno(1,2,3-cd)pyrene	260	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	193-39-5	
Naphthalene	12.9	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	91-20-3	
Naphthalene	<96.8	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	91-20-3	
Phenanthrene	54.0	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	85-01-8	
Phenanthrene	<96.8	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	85-01-8	
Pyrene	449	ug/kg	9.7	1	09/29/21 12:44	09/30/21 23:44	129-00-0	
Pyrene	555	ug/kg	96.8	10	09/29/21 12:44	10/01/21 13:31	129-00-0	

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ANALYTICAL RESULTS

Project: SLRRP / 30045984

Pace Project No.: 70188934

Sample: A-20-COMP **Lab ID: 70188934008** Collected: 09/24/21 07:50 Received: 09/25/21 10:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM								
Analytical Method: EPA 8270D SIM Preparation Method: EPA 3545A								
Pace Analytical Services - Melville								
Surrogates								
2-Methylnaphthalene-d10 (S)	0	%	20-105	10	09/29/21 12:44	10/01/21 13:31	7297-45-2	S4
2-Methylnaphthalene-d10 (S)	43	%	20-105	1	09/29/21 12:44	09/30/21 23:44	7297-45-2	
Fluoranthene-d10 (S)	57	%	33-128	1	09/29/21 12:44	09/30/21 23:44	93951-69-0	
Fluoranthene-d10 (S)	0	%	33-128	10	09/29/21 12:44	10/01/21 13:31	93951-69-0	S4
Percent Moisture								
Analytical Method: ASTM D2216-05M								
Pace Analytical Services - Melville								
Percent Moisture	48.9	%	0.10	1		10/05/21 01:10		
TOC via Lloyd Kahn								
Analytical Method: Lloyd Kahn								
Pace Analytical Services - Green Bay								
Total Organic Carbon	20200	mg/kg	1790	1		10/05/21 04:54	7440-44-0	C4 J

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ANALYTICAL RESULTS

Project: SLRRP / 30045984

Pace Project No.: 70188934

Sample: DUP-092421 **Lab ID: 70188934009** Collected: 09/24/21 00:00 Received: 09/25/21 10:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3546								
Pace Analytical Services - Melville								
PCB-1016 (Aroclor 1016)	<56.6	ug/kg	56.6	1	09/27/21 11:27	09/28/21 20:24	12674-11-2	
PCB-1221 (Aroclor 1221)	<56.6	ug/kg	56.6	1	09/27/21 11:27	09/28/21 20:24	11104-28-2	
PCB-1232 (Aroclor 1232)	<56.6	ug/kg	56.6	1	09/27/21 11:27	09/28/21 20:24	11141-16-5	
PCB-1242 (Aroclor 1242)	734	ug/kg	56.6	1	09/27/21 11:27	09/28/21 20:24	53469-21-9	J
PCB-1248 (Aroclor 1248)	<56.6	ug/kg	56.6	1	09/27/21 11:27	09/28/21 20:24	12672-29-6	
PCB-1254 (Aroclor 1254)	<56.6	ug/kg	56.6	1	09/27/21 11:27	09/28/21 20:24	11097-69-1	
PCB-1260 (Aroclor 1260)	<56.6	ug/kg	56.6	1	09/27/21 11:27	09/28/21 20:24	11096-82-5	
Surrogates								
Tetrachloro-m-xylene (S)	107	%	46-120	1	09/27/21 11:27	09/28/21 20:24	877-09-8	
Decachlorobiphenyl (S)	106	%	47-135	1	09/27/21 11:27	09/28/21 20:24	2051-24-3	

Percent Moisture

Analytical Method: ASTM D2216-05M

Pace Analytical Services - Melville

Percent Moisture	42.3	%	0.10	1		10/05/21 01:10		
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ANALYTICAL RESULTS

Project: SLRRP / 30045984

Pace Project No.: 70188934

Sample: D-116-COMP **Lab ID: 70188934010** Collected: 09/23/21 14:10 Received: 09/25/21 10:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM								
Analytical Method: EPA 8270D SIM Preparation Method: EPA 3545A Pace Analytical Services - Melville								
Acenaphthene	<9.7	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	83-32-9	
Acenaphthylene	<9.7	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	208-96-8	
Anthracene	16.0	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	120-12-7	
Benzo(a)anthracene	88.3 J	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	56-55-3	J
Benzo(a)pyrene	129 J	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	50-32-8	J
Benzo(b)fluoranthene	348 J	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	205-99-2	J
Benzo(g,h,i)perylene	125 J	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	191-24-2	J
Benzo(k)fluoranthene	97.2 J	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	207-08-9	J
Chrysene	284 J	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	218-01-9	M1,R1 J
Dibenz(a,h)anthracene	39.8 J	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	53-70-3	J
Fluoranthene	66.7 J	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	206-44-0	M1,R1 J
Fluorene	<9.7	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	86-73-7	
Indeno(1,2,3-cd)pyrene	107 J	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	193-39-5	J
Naphthalene	<9.7	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	91-20-3	
Phenanthrene	33.0 J	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	85-01-8	J
Pyrene	46.3 J	ug/kg	9.7	1	09/29/21 12:44	10/01/21 00:17	129-00-0	R1 J
Surrogates								
2-Methylnaphthalene-d10 (S)	46	%	20-105	1	09/29/21 12:44	10/01/21 00:17	7297-45-2	
Fluoranthene-d10 (S)	56	%	33-128	1	09/29/21 12:44	10/01/21 00:17	93951-69-0	

Percent Moisture

Analytical Method: ASTM D2216-05M
Pace Analytical Services - Melville

Percent Moisture	48.8	%	0.10	1		10/05/21 01:10
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TOC via Lloyd Kahn

Analytical Method: Lloyd Kahn
Pace Analytical Services - Green Bay

Total Organic Carbon	41400	mg/kg	3540	1		10/05/21 05:00	7440-44-0	C4,M0 J
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ANALYTICAL RESULTS

Project: SLRRP / 30045984
Pace Project No.: 70188934

Sample: DUP-09231 **Lab ID: 70188934011** Collected: 09/23/21 14:10 Received: 09/25/21 10:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM		Analytical Method: EPA 8270D SIM Preparation Method: EPA 3545A Pace Analytical Services - Melville						
Acenaphthene	11.5	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	83-32-9	
Acenaphthene	<9.1	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	83-32-9	
Acenaphthylene	<9.9	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	208-96-8	
Acenaphthylene	<9.1	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	208-96-8	
Anthracene	34.8	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	120-12-7	
Anthracene	<9.1	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	120-12-7	
Benzo(a)anthracene	363 J	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	56-55-3	J
Benzo(a)anthracene	378	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	56-55-3	
Benzo(a)pyrene	279 J	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	50-32-8	J
Benzo(a)pyrene	309	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	50-32-8	
Benzo(b)fluoranthene	1370	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	205-99-2	E
Benzo(b)fluoranthene	1470 D J	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	205-99-2	DJ
Benzo(g,h,i)perylene	268 J	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	191-24-2	J
Benzo(g,h,i)perylene	369	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	191-24-2	
Benzo(k)fluoranthene	503 J	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	207-08-9	J
Benzo(k)fluoranthene	557	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	207-08-9	
Chrysene	919	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	218-01-9	E
Chrysene	993 D J	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	218-01-9	DJ
Dibenz(a,h)anthracene	114 J	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	53-70-3	J
Dibenz(a,h)anthracene	125	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	53-70-3	
Fluoranthene	250 J	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	206-44-0	J
Fluoranthene	269	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	206-44-0	
Fluorene	15.0	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	86-73-7	
Fluorene	<9.1	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	86-73-7	
Indeno(1,2,3-cd)pyrene	264 J	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	193-39-5	J
Indeno(1,2,3-cd)pyrene	304	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	193-39-5	
Naphthalene	11.5	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	91-20-3	
Naphthalene	<9.1	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	91-20-3	
Phenanthrene	121 J	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	85-01-8	J
Phenanthrene	131	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	85-01-8	
Pyrene	211 J	ug/kg	9.9	1	09/29/21 12:44	10/01/21 01:55	129-00-0	J
Pyrene	245	ug/kg	9.9	10	09/29/21 12:44	10/01/21 14:03	129-00-0	
Surrogates								
2-Methylnaphthalene-d10 (S)	46	%	20-105	1	09/29/21 12:44	10/01/21 01:55	7297-45-2	
2-Methylnaphthalene-d10 (S)	0	%	20-105	10	09/29/21 12:44	10/01/21 14:03	7297-45-2	S4
Fluoranthene-d10 (S)	61	%	33-128	1	09/29/21 12:44	10/01/21 01:55	93951-69-0	
Fluoranthene-d10 (S)	0	%	33-128	10	09/29/21 12:44	10/01/21 14:03	93951-69-0	S4

Percent Moisture

Analytical Method: ASTM D2216-05M
Pace Analytical Services - Melville

Percent Moisture **50.0** % 0.10 1 10/05/21 01:11

TOC via Lloyd Kahn

Analytical Method: Lloyd Kahn
Pace Analytical Services - Green Bay

Total Organic Carbon **32700** mg/kg 1940 1 10/05/21 05:18 7440-44-0 ~~C4~~ J

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ANALYTICAL RESULTS

Project: SLRRP / 30045984

Pace Project No.: 70188934

Sample: RB-092321		Lab ID: 70188934012		Collected: 09/23/21 07:00		Received: 09/25/21 10:20		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8082 GCS PCB									
Analytical Method: EPA 8082A Preparation Method: EPA 3510C									
Pace Analytical Services - Melville									
PCB-1016 (Aroclor 1016)	<1.0	ug/L	1.0	1	09/30/21 13:29	10/01/21 19:01	12674-11-2		
PCB-1221 (Aroclor 1221)	<1.0	ug/L	1.0	1	09/30/21 13:29	10/01/21 19:01	11104-28-2		
PCB-1232 (Aroclor 1232)	<1.0	ug/L	1.0	1	09/30/21 13:29	10/01/21 19:01	11141-16-5		
PCB-1242 (Aroclor 1242)	<1.0	ug/L	1.0	1	09/30/21 13:29	10/01/21 19:01	53469-21-9		
PCB-1248 (Aroclor 1248)	<1.0	ug/L	1.0	1	09/30/21 13:29	10/01/21 19:01	12672-29-6		
PCB-1254 (Aroclor 1254)	<1.0	ug/L	1.0	1	09/30/21 13:29	10/01/21 19:01	11097-69-1		
PCB-1260 (Aroclor 1260)	<1.0	ug/L	1.0	1	09/30/21 13:29	10/01/21 19:01	11096-82-5		
Surrogates									
Tetrachloro-m-xylene (S)	113	%	37-105	1	09/30/21 13:29	10/01/21 19:01	877-09-8	S3	
Decachlorobiphenyl (S)	63	%	10-138	1	09/30/21 13:29	10/01/21 19:01	2051-24-3		
8270 MSSV PAH by SIM									
Analytical Method: EPA 8270D SIM Preparation Method: EPA 3510C									
Pace Analytical Services - Melville									
Acenaphthene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	83-32-9		
Acenaphthylene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	208-96-8		
Anthracene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	120-12-7		
Benzo(a)anthracene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	56-55-3		
Benzo(a)pyrene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	50-32-8		
Benzo(b)fluoranthene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	205-99-2		
Benzo(g,h,i)perylene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	191-24-2		
Benzo(k)fluoranthene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	207-08-9		
Chrysene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	218-01-9		
Dibenz(a,h)anthracene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	53-70-3		
Fluoranthene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	206-44-0		
Fluorene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	86-73-7		
Indeno(1,2,3-cd)pyrene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	193-39-5		
Naphthalene	0.023	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	91-20-3		
Phenanthrene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	85-01-8		
Pyrene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 21:47	129-00-0		
Surrogates									
Fluoranthene-d10 (S)	71	%	40-112	1	09/29/21 13:42	09/29/21 21:47	93951-69-0		
2-Methylnaphthalene-d10 (S)	61	%	44-146	1	09/29/21 13:42	09/29/21 21:47	7297-45-2		

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ANALYTICAL RESULTS

Project: SLRRP / 30045984

Pace Project No.: 70188934

Sample: RB-092421		Lab ID: 70188934013		Collected: 09/24/21 07:00		Received: 09/25/21 10:20		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8082 GCS PCB									
Analytical Method: EPA 8082A Preparation Method: EPA 3510C									
Pace Analytical Services - Melville									
PCB-1016 (Aroclor 1016)	<1.0	ug/L	1.0	1	09/30/21 13:29	10/01/21 19:13	12674-11-2		
PCB-1221 (Aroclor 1221)	<1.0	ug/L	1.0	1	09/30/21 13:29	10/01/21 19:13	11104-28-2		
PCB-1232 (Aroclor 1232)	<1.0	ug/L	1.0	1	09/30/21 13:29	10/01/21 19:13	11141-16-5		
PCB-1242 (Aroclor 1242)	<1.0	ug/L	1.0	1	09/30/21 13:29	10/01/21 19:13	53469-21-9		
PCB-1248 (Aroclor 1248)	<1.0	ug/L	1.0	1	09/30/21 13:29	10/01/21 19:13	12672-29-6		
PCB-1254 (Aroclor 1254)	<1.0	ug/L	1.0	1	09/30/21 13:29	10/01/21 19:13	11097-69-1		
PCB-1260 (Aroclor 1260)	<1.0	ug/L	1.0	1	09/30/21 13:29	10/01/21 19:13	11096-82-5		
Surrogates									
Tetrachloro-m-xylene (S)	102	%	37-105	1	09/30/21 13:29	10/01/21 19:13	877-09-8		
Decachlorobiphenyl (S)	41	%	10-138	1	09/30/21 13:29	10/01/21 19:13	2051-24-3		
8270 MSSV PAH by SIM									
Analytical Method: EPA 8270D SIM Preparation Method: EPA 3510C									
Pace Analytical Services - Melville									
Acenaphthene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	83-32-9		
Acenaphthylene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	208-96-8		
Anthracene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	120-12-7		
Benzo(a)anthracene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	56-55-3		
Benzo(a)pyrene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	50-32-8		
Benzo(b)fluoranthene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	205-99-2		
Benzo(g,h,i)perylene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	191-24-2		
Benzo(k)fluoranthene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	207-08-9		
Chrysene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	218-01-9		
Dibenz(a,h)anthracene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	53-70-3		
Fluoranthene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	206-44-0		
Fluorene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	86-73-7		
Indeno(1,2,3-cd)pyrene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	193-39-5		
Naphthalene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	91-20-3		
Phenanthrene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	85-01-8		
Pyrene	<0.020	ug/L	0.020	1	09/29/21 13:42	09/29/21 22:19	129-00-0		
Surrogates									
Fluoranthene-d10 (S)	77	%	40-112	1	09/29/21 13:42	09/29/21 22:19	93951-69-0		
2-Methylnaphthalene-d10 (S)	69	%	44-146	1	09/29/21 13:42	09/29/21 22:19	7297-45-2		

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